TECHNOLOGY INTEGRATION FOR THE *NEW* 21ST CENTURY LEARNER

Today's students need educators to re-envision the role of technology in the classroom.

BY NANCYE BLAIR

A DRAMATIC SHIFT is sweeping through our schools. The signs are all around us. Third graders texting on their cell phones. Kindergarteners who can navigate an iPod Touch better than we can. Middle schoolers who already have an Internet following on their blog or YouTube channel.

These are not the same 21st century learners we came to know over the first decade of the new millennium. For these students, simply watching videos or images during class, playing an Internet multiplication game, or even taking turns at an interactive whiteboard is no longer enough.

These *new* 21st century learners are highly relational and demand quick access to new knowledge. More than that, they are capable of engaging in learning at a whole new level. With the world literally at their fingertips, today's students need teachers and administrators to re-envision the role of technology in the classroom.

Artwork by Reagan C., Karlee S., and Gregory D., students at McKeel Elementary Academy.

Technology Integration Remixed

The new 21st century learners must master more than the core curriculum to succeed in secondary and postsecondary institutions, as well as in the workplace. The Partnership for 21st Century Skills, a national organization advocating for 21st century readiness for every student, explains the outcomes of this transformation as fusing the traditional three R's with four C's: critical thinking, creativity, communication, and collaboration.

As students develop the four C's, we have discovered that effective application of these vital skills in a technology-infused life and workplace requires acquiring them in a technology-infused learning environment. This environment calls for two elements: We must increasingly put technology into the hands of students and must trust them with more progressive technology use.

It is no longer sufficient for students to have less access to technological tools than the teacher, nor is it enough for any one suite of software to serve as the zenith for technology mastery. For student performance to approximate student potential, students need access to a constantly evolving array of technological tools and activities that demand problem-solving, decision-making,

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ONLINE

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Discover resources and tutorials for Technology Integration and Student-Created Digital Media through the **author's blog**.

Learn more about implementing the International Society for Technology in Education's **National Educational Technology Standards (NETS)** for Students, Teachers, and Administrators.

Listen to Sugata Mitra share more about his research through his TED Talk titled **"The Child-Driven Education**."

Gain **technology integration** tips on the Edutopia website.

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teamwork, and innovation. The four C's are at the heart of the International Society for Technology in Education's National Educational Technology Standards (NETS) for Students, providing a substantial framework for defining the focus of technology objectives for K-12 students. For example, in implementing these standards we have found that even our youngest 21st century learners are capable of independently creating digital storybooks, artwork, presentations, and movies.

Shift in Roles

Following the joyous moment when educators realize their students are capable, independent technology users who can create inspiring digital masterpieces, the next reaction is often a more solemn, "How do we fit it all in?" In fact, the answer to this question is vital to a successful technology integration transformation.

In the former mindset of teaching *with* technology, the teacher was the focal point of the classroom, creating (often time-consuming) interactive

and multimedia presentations to add shock and awe to his or her lessons and capture the attention of the 21st century child. A new mindset of teaching *through* technology must emerge, which depends on a vital shift in teacher/student roles.

In this configuration, the teacher acts as a learning catalyst, orchestrating and facilitating activities that spark defining moments for students. The most effective activities take two forms— discovery and creation— though they often symbiotically work together. The student then becomes the focal point of the classroom, acting as explorer (e.g., mathematician, scientist, sociologist) and designer (e.g., author, artist, composer).

This is a liberating shift. As teachers spend less time creating presentations and more time crafting powerful learning activities, they will find that material is covered with more depth and retention the first time around, saving them time and energy in the long run. Moreover, by allowing students to be explorers and designers, educators show that they believe in their students' abilities and validate each student's contribution to the class.

Discovery and Exploration. In technology-infused discovery activities, Internet research, virtual manipulatives, and multimedia resources allow students to explore unanswered questions. For example, instead of beginning a lesson on geometric transformations by listening to a lecture or looking at examples on the board, a fourth grader might use the free geometric transformation activities in Utah State University's National Library of Virtual Manipulatives (**nlvm.usu.edu**) to answer a probing question such as "What is a geometric reflection?" Middle schoolers might take it a step further to discover and develop steps for graphing a reflection on a coordinate plane. Exploring as a real mathematician would, students try to understand, analyze, and evaluate their experience to answer the posed question.

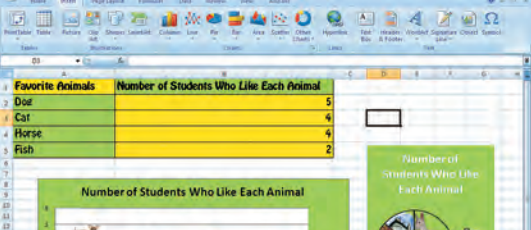Discovery activities give students real-world, problem-solving experience

McKeel Elementary Academy students produce work for authentic audiences.

and ownership over their learning, as well as allow them to bring their observations into the subsequent lesson, discussion, or creation activity as prior knowledge.

Creation and Design. Likewise, creation activities provide students the ability to develop creativity and problem-solving skills by displaying their mastery in profound and meaningful ways. Teachers at McKeel Elementary Academy in Lakeland, Florida, integrate the use of technology for student-created digital media into all areas of curriculum:

■ Kindergarteners create image-based movies on recycling and insects;

■ First graders develop PowerPoint presentations for "My Time to Teach" projects to share with the class;

■ Fourth graders prepare for their statewide standardized writing assessment by developing elaborate digital storybooks on free web 2.0 sites such as Storybird (**www.storybird.com**) or StoryJumper (**www.storyjumper. com**); and

■ Fifth graders collaborate to launch a Web Safety Wiki to teach other students worldwide about digital citizenship (**wildcatwebsafety. wikispaces.com**).

The projects created are excellent tools for formative and summative assessment. Yet more than that, through creation activities, students design products that make them active partners in constructing learning experiences in the classroom and beyond. In demonstrating their skills and knowledge, they become more confident in their own abilities and their own voices.

Authentic Audiences

One of the greatest benefits of 21st century technology infusion is also one of the key mandates for successful technology integration. Traditionally, students have composed their work for an audience of one—the teacher. By using technological resources to establish authentic audiences for student work, we tell students that their work is worth seeing, worth reading, and worth doing.

Authentic audiences come in many forms—class presentations, school news shows, school websites, film festivals, literary publications, online publishing through blogs or other web 2.0 tools, contests and competitions, and Skyping with other classes around the world.

Two years ago, several students at McKeel entered a Winter Story Competition sponsored by E2BN, using its Myths and Legends Story Creator (**myths.e2bn.org**). Having access to a dynamic digital storytelling tool and the promise of an international audience of students, McKeel students were motivated to write, enhance, and edit their stories—and it paid off. One fourth grader won the text-only competition; another was recognized as runner-up in the illustrated division. Students from around the world who read these stories shared their feedback and congratulations through the site's online commenting system. Among others, the runner-up student received this comment: "I read all the stories in the contest and yours is the best! Be a writer when you grow up. You will be world wide!"

One comment like that can transform a student's outlook on his or her education. As an International Story Contest runner-up at age 9, this creative young girl now plans to be a writer when she grows up.

Worldwide, students and teachers are discovering the benefits of global collaboration and the power of authentic audiences. For example, students at Lincoln Middle School in Santa Monica, California, share a collection of student-created math screencasts at **Mathtrain. TV**, which has received more than 350,000 views. The ThinkQuest Project Library (**www.thinkquest.org/library/**) hosts more than 8,000 student-created websites designed by ThinkQuest competitors.

Through effective use of technology, every new 21st century learner can have the opportunity to learn from and publish to an eager global audience.

A Device for Every Child?

With potential fingertip access to such incredible student opportunities on the line, principals and teachers have a great responsibility to innovatively harness the power of technological resources.

Ideally, to maximize these opportunities, every student needs direct access to technology on a daily basis. This means moving away from the days of visiting the computer lab toward a one-to-one initiative in the classroom. Unfortunately, with variable school budgets and technology resources, this often seems like a daunting task.

Easing the resource strain, affordable netbooks and handheld devices have become worthy supplements, or even replacements, for more expensive desktops or laptops. Combine that with the bounty of free educational web 2.0 sites and apps, as well as an increasing number of websites with fees that offer free access to educators and students (e.g., **www.xtranormal.com** and **www. wikispaces.com**), and it becomes much easier to provide classrooms with rich technological resources.